Product Technical Manual

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Product Name： Polyurethane material for water shutoff at coal mine

Version：V 3.1

Product Introduction

After uniform mixing of Component A and B of polyurethane materials for water shutoff at coal mine at 1:1 volume ratio, the material rapidly polymerizes into an insoluble and infusible polymer. It demonstrates exceptional compressive strength, adhesion, and solvent corrosion resistance. In water-containing environments, the mixed resin expands at a high ratio to densely seal all fissures, while maintaining flexibility to deform with surrounding rock strata and sustain effective sealing performance.

Product Usage

Polyurethane materials for water shutoff at coal mine are suitable for waterproofing and leakage sealing in mining and tunnel engineering applications. Specific use cases include: Rapid sealing of water leakage or inflow in coal/rock mass fissures, Sealing of concrete crack leakage in shaft linings, Treatment of water seepage in geological structures such as faults, fractured zones, and collapse column.

Product Features

Polyurethane material (A and B components mixed at 1:1 volume ratio)for water shutoff at coal mine polymerizes into an insoluble and non-melting polymer with the following characteristics:

1.Flame retardancy – Complies with MT 113-1995 standard

2.Exhibits excellent resistance to solvents and chemical corrosion

3.Low viscosity and high permeability

4.Exceptional anti-static performance

5.Rapid construction, low-odor or odorless

6.Strong adhesive force and mechanical strength with toughness to withstand long-term ground pressure.

Physical and Chemical Properties

Main Components	Component A	Component B
Appearance	Colorless to pale yellow liquid	Dark brown liquid
Specific Gravity (23±2 ℃), kg/m³	1100±50	1230±50
Viscosity (23±2 ℃), mPa·s	200-500	200-500
Mixing Volume Ratio	1	1
Effective Storage Period (23±2 ℃), Months	6	6

Physical Properties

Item	Specification
Start Time of Curing, s	30±10
Completion Time of Curing, s	60±10
Expansion Ratio	≥1.0
Anti-aging performance（80℃±2℃；168h），%	No visible changes Compressive strength loss≤5
Permeability coefficient，cm/s	$\leq 1x10^{-6}$
Water quality impact	Complies with the drinking water quality requirements specified in GB/T 5749-2006
Maximum reaction temperature，℃	＜140
Compressive strength，MPa	≥50
Tensile strength，MPa	≥20
Shear strength，MPa	⩾20
Freeze-thaw resistance（200次）	No powdering, cracking, peeling, bubbling, or significant discoloration

Note: The technical parameters herein are derived from laboratory testing and may deviate under actual application conditions. These values are provided for reference only and do not constitute legally binding obligations.

Usage Precautions

For the application of polyurethane material for consolidating coal and rock, appropriate construction equipment should be selected, including mixing pumps and spray guns, high-pressure spraying machines (equipped with injection nozzles), or other grouting devices.

Prior to construction, ensure calibration of the grouting equipment to verify the component mixing ratio and mixing pressure.

Before commencing formal construction, the buyer must conduct material reliability tests under conditions identical to the actual construction environment to verify the applicability of the composite materials.

Packing Details

Component A liquid material: 25 kg/drum

Component B liquid material: 25 kg/drum

Storage (Usage) Precautions

The composite material should be stored in closed containers to avoid absorbing moisture. Therefore, during storage and transportation, the containers must remain dry and tightly sealed.

The composite material should be sealed and stored at room temperature (5℃ to 35℃), well-ventilated, and shaded area. Avoid direct sunlight or long-term storage above 40℃, which may reduce foam performance.

Expiration Date

Under suitable storage conditions, the storage period of polyurethane material for consolidating coal and rock at coal mine is 6 months. After exceeding 6 months, the material can continue to be used only after passing the inspections.

Safety Precautions

Direct contact with the material may cause moderate eye irritation and mild skin irritation, potentially leading to skin allergies. Repeated inhalation of high-concentration vapors can induce respiratory allergies. Immediate medical attention should be sought, and anti-inflammatory and anti-allergic symptomatic treatment measures should be administered.

During operation, exercise caution to prevent direct contact with skin or splashing into eyes. Wear necessary protective equipment (gloves, protective goggles, work clothes, etc.).

In case of skin or eye contact, rinse immediately with clean water for at least 15 minutes. Wash the skin with soapy water and seek medical attention if necessary. If accidentally ingested, seek immediate medical treatment for symptomatic management.

Fire and Explosion Hazards

This product is not classified as flammable liquids, explosives, oxidizers, corrosives, toxic substances, or radioactive hazardous materials during storage and transportation. It is not categorized as a hazardous product.

Carbon dioxide, foam, or chemical dry-powder fire extinguishers can be used. If no other fire-extinguishing agents are available, a large amount of water mist can be sprayed. Once the fire is extinguished, the spilled materials must be thoroughly cleaned (refer to the "Spill and Leakage Handling" section).

Fire-Fighting Procedure: Standard protective measures.

Spill and Leakage Handling

Small amounts of leaked or spilled materials can be rinsed away with water. In case of large-scale leakage, contain and recover the materials, and wash the contaminated ground with water or detergent. The disposal of waste composite materials must comply with the local government's environmental protection regulations.

For more information, please refer to the Safety Data Sheet (SDS) of our products or contact our Customer Service Center.

The indicators and data provided in this document are based on our current level of technical knowledge and practical experience, and are for reference only. Specific guaranteed indicators are subject to the quality assurance certificate or supply contract. The user is responsible for testing the products purchased from our company to verify their suitability for their intended processes and applications, and to achieve the desired objectives. Further application and processing of our products are beyond our control. Therefore, our liability for the products provided is limited to the portion delivered by us and used by you. We do not assume responsibility for indirect losses incurred during the production process using our products as raw materials. Our technical support and customer service center are available to provide consultation and technical services related to our products. We welcome your inquiries and communication via mail or phone.

联系地址：山东省烟台市太原路 56 号，万华节能科技（烟台）有限公司

电话：400-059-1116 传真：(86)-0535-6809777 邮编：264006